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FIRST DESTINATION TRANSPORTATION COST FOR AMMUNITION

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Army Armament Command
Rock Island, Illinois

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FIRST DESTINATION TRANSPORTATION COST FOR AMMUNITION

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TECHNICAL REPORT

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CONTENTS

I. Introduction

The determination of first destination transportation (FDT) costs for ammunition items has long been a concern of the US Army Armament Command, (ARMCOM). Due to shifts in international priorities and changing transportation situations, the established method of using 3 percent of the standard price to estimate total FDT cost was determined to be in need of review.

A study was conducted in 1971 by the former US Army Munitions Command (MUCOM), but it was never fully applied (ref 1). In 1974, the study received attention for possible application within ARMCOM. However, because of the lack of back-up information on the study, and the complexity of the methodology involved, it was decided that a more straightforward, documented approach should be taken.

Until the new study could be completed, factors for estimating FDT costs were established by the ARMCOM pricing committee. These factors divided FDT costs into interim and second-leg components. The interim component (3 percent of component standard price) represented costs for shipments of components to the load, assemble, and pack (LAP) plants, while the second-leg component (4 percent of end-item standard price) depicted shipments from the LAP plants to ports and depots within the United States.

After discussions with personnel from the budgeting and transportation areas of ARMCOM, a study methodology was developed. It would involve the collection of relevant data from Government bills of lading (GBL)

for selected components and end-items. Groupings would be made by caliber, if necessary, to arrive at common percentage factors which, when applied to unit characteristics available on the GBL, would represent actual interim and second-leg FDT costs.

That data collection, however, was extremely difficult because it did not follow existing reporting procedures. After working through the ARMCOM Transportation Directorate and individual LAP plants, the data had to be manually extracted from hundreds of GBLs. Further, the GBLs often reflected mixed shipments of components or end-items, making it impossible to ascertain unit data. This effort had to be abandoned.

Transportation personnel were again contacted in order to establish a new approach to determine FDT costs. Consequently, a new methodology was developed based on the assumption that transportation costs are primarily determined by weight, regardless of the caliber of the end-item. It was realized that other variables also influence FDT costs, although many were not readily available prior to shipment. Of variables that were available, standard price and unit volume were chosen in addition to unit weight as possible predictors of FDT costs. Thus the questions to be answered by this study were: Can unit weight, standard price, and unit volume significantly predict FDT costs? If so, what are the relationships involved?

II. Model

To answer the above questions, the independent variables of end-item weight, end-item volume, and standard price were analyzed by using the methods of simple and multiple regression. Separate analyses were conducted for each of three dependent variables-- total, second-leg, and interim FDT costs.

For each dependent variable, several regression forms and combinations of independent variables were utilized. Some of the simple regressions employed were of the forms:

$$Y = A + BX$$

$$Y = AX^B$$

$$Y = A + B\ (\mathrm{Ln}X)$$

$$Y = 1/(A + BX)$$

$$\sqrt{Y} = A + BX$$

$$Y = A + B\sqrt{X}$$

$$\sqrt{Y} = A + B\sqrt{X}$$

where Y is the dependent variable, A is a constant, B is a regression coefficient, and X is the independent variable.

Two multiple regression forms were also employed. These were:

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3$$

and $Y = AX_1^{B_1}\ X_2^{\ B_2}\ X_3^{B_3}$

where, again, Y and A are defined as above, while B_1, B_2, B_3 are regression coefficients for the corresponding independent variables of

X_1, X_2, X_3.

In addition to the original independent variables, new independent variables were created by combining the originals. For example, some regressions were run using the product of weight and price as an independent variable, while others were run using the quotient of weight and price.

The regression analyses were conducted using the BMD03R computer program, a multiple regression package in the library of Biomedical Computer Programs originated at the University of California.

A myriad of regression equations resulted from the many combinations of initial independent variables and transformations, and the various subsamples of data examined. To select the most appropriate ones, several criteria were used:

(1) No negative estimates of the dependent variable. It would not be practical to predict negative FDT costs.

(2) F statistic. The equation must be statistically significant at the 99 percent level. Indicated by the F statistic, significance means that the probability is less than 0.01 that the disparity between the calculated explained and unexplained variations in the dependent variable is due to chance. Thus, if the calculated value of F is greater than the critical value for the particular regression, it can be said that the independent variables significantly explain the variation in the dependent variable.

(3) Coefficient of determination (R^2). Similar to the F statistic,

R^2 represents the fractional amount of variation in the dependent variable which is explained by the regression line.

(4) <u>Standard error of the estimate (S)</u>. This is a measure of the goodness of fit of the regression line and is of the form

$$S = \frac{1}{n - k} \sum_{i=1}^{n} (Y_i - \hat{Y}_i)^2$$

where:

Y_i = actual values of the dependent variable

$\hat{Y}_i$ = estimated values of the dependent variable

n = number of observations

k = number of variables

(5) <u>Mean absolute percent deviation (MAPD)</u>. For this study, the MAPD measures how close the actual values of the dependent varible come to the regression line. Thus it indicates how well future FDT costs will be predicted by the regression equation. The MAPD is defined here as

$$MAPD = \frac{1}{n} \sum_{i=1}^{n} \frac{Y_i - \hat{Y}_i}{\hat{Y}_i}$$

where:

Y_i = actual value of the dependent variable

$\hat{Y}_i$ = estimated value of the dependent variable

n = number of observations

III. Data

The data are cross-sectional, covering the third quarter of fiscal year 1975. A representative sample of end-items and quantities was chosen by AMSAR-TM from the FY 75 Ammunition Shopping List (dated 11 Nov 74 and updated as of 3 Mar 75), as provided by AMSAR-MM. Items were identified by Department of Defense identification code (DODIC) and there was no distinction made for individual rounds within a certain DODIC.

AMSAR-TM also supplied unit weight, unit volume, and both interim and second-leg FDT costs. The weight and volume information includes packaging for shipment and was figured by dividing the total pallet weight and volume by the number of items per pallet. To obtain interim FDT costs, AMSAR-TM traced the most likely path of individual components for each end-item into the appropriate LAP plants. If more than one LAP plant were used for a single end-item, then a path was traced going into each plant. Likewise, if components were obtained from multiple sources, separate paths were traced. Appropriate transportation rates for the quantities involved were then applied to arrive at the actual interim FDT cost.

Second-leg FDT costs were similarly obtained by tracing the most likely paths from LAP plants to depots and ports within the continental United States. Here again when several paths applied, each was traced according to the quantities involved. The total FDT costs were derived simply by adding the interim and second-leg elements.

The standard price information used in this study was obtained from the automated standard price program of the Procurement and Production Directorate, ARMCOM, as of 31 Mar 75. A special run of this program was made which excluded all FDT costs and identified those component items to which interim FDT applied. A distinction was made between standard prices used in determining interim and second-leg FDT costs. The interim standard price was defined as the sum of the individual component standard prices, excluding FDT costs, to which interim transportation applied. On the other hand, end-item standard price was defined as the total standard price, excluding FDT costs.

Standard price information was not available from the automated pricing program for all end-items selected by AMSAR-TM. In these cases, the end-items were excluded from the regression analyses involving standard price.

In a few cases, there were separate standard prices for individual items within a single DODIC category. This was attributable to using, for example, both Composition B and TNT as explosive fill. Because of the arbitrary nature of selecting rounds within a particular DODIC, a representative standard price could not be determined. Therefore, these cases were also excluded from regression analyses involving price.

A complete listing of the data used is displayed in Table 1.

TABLE 1

DODIC	NOMENCLATURE	Unit Weight (lbs)	Unit Volume (ft^3)	Standard Price (interim)	Standard Price (2nd)	Interim FDT	Second-leg FDT	Total FDT
A071	5.56mm Cartridge Ball M193 f/ Rifle M16	.0414	.0006	NA	.0757	.0001	.0009	.0010
A080	5.56mm Cartridge Bland M200 f/ Rifle M16	.0248	.0005	NA	.0579	.0001	.0005	.0006
A131	7.62mm Cart NATO Linked f/Ball M80 TR4-41	.1009	.0017	NA	.1321	.0002	.0023	.0025
A792	20mm Cart TPT M220 M14A1 M548	.9885	.0194	NA	NA	.0127	.0261	.0388
B546	40mm Cart (M433) HE	.8318	.1303	3.5953	4.5043	.0278	.0334	.0612
B577	40mm Cart M407	.8125	.0211	2.6564	3.3655	.0290	.0117	.0407
B632	60mm Cart M49	5.5116	.1380	8.7267	11.2010	.0511	.2223	.2734
C256	81mm Cart M374 HE	18.9815	.5120	13.5356	24.5198	.2821	.6877	.9698
C445	105mm Cart M1 HE	56.7083	1.0667	NA	NA	.7655	1.5380	2.3035
C449	105mm Cart Illum M314	58.3333	1.1000	NA	NA	.9769	1.7308	2.7077
C511	105mm Cart M490 TP-T	73.4667	1.8433	87.2201	98.0468	1.1419	1.6738	2.8157
C518	105mm Cart M393 HEP-T	71.1667	1.9500	83.8489	99.7459	1.4744	2.3156	3.7900
C650	106mm Cart M344 HEAT	58.1000	1.5367	76.1096	95.4727	.3558	2.3871	2.7429
C651	106mm Cart M346 HEP-T	63.0000	1.5200	73.5731	96.2963	.5181	2.5864	3.1045
C705	4.2" Cart M335 Illum	41.5000	.9583	41.1460	65.9413	.5082	1.1465	1.6547
D540	155mm Prop Charge M3 GB	16.8571	.6271	10.9698	19.2213	.0900	.5747	.6647
D541	155mm Prop Charge M4A1 WB	34.4400	1.1720	16.7500	26.5895	.2025	1.1478	1.3503
D544	155mm Proj M107 HE	99.8750	.8288	NA	NA	2.3405	2.5274	4.8679
D563	155mm Proj HE XM483	109.2500	1.2375	NA	NA	1.9543	2.3945	4.3488
G881	Grenade, Hand Frag. M67	1.9656	.0561	1.2801	2.6013	.0282	.0589	.0871
G945	Grenade, Hand/Rifle Smoke	2.0023	.0706	NA	NA	.0073	.0626	.0699
K143	Mine, AP M18A1 T48E3 Claymore	10.0046	.2481	13.0196	23.1563	.0353	.2424	.2777
L495	Flare, Surface, Trip	1.9132	.0625	0	5.6553	0	.0569	.0569
N278	Fuze MTSQ M564	3.6458	.0826	23.7792	26.0295	.0827	.1607	.2434
N335	Fuze PD M557	3.7431	.0785	5.9888	7.8937	.0233	.1629	.1862

Note: NA = not available for this study.

IV. Results

A. General

Of the three independent variables examined, weight appeared to be the most significant predictor. Price did not perform as well when used alone, and did not contribute notable when used in conjunction with the other independent variables. Furthermore, price is less accessible to the user and less stable than are weight and volume. Therefore, although regressions were made using price as an independent variable, they are not reported here.

In all cases, the exponential form of equation produced the most significant results. An added advantage of using the exponential form was that the intercept value was always positive. On the other hand, linear equation forms, although less complex and often statistically significant, sometimes produced negative intercept values which could cause some estimates of the dependent variable to be negative.

Many simple and multiple regressions were run using various combinations of variables and derived forms. Furthermore, several subsamples of the complete data were explored to see if results could be improved. Only the most relevant results, however, are reported here.

B. Predictions of total FDT costs

Weight alone was found to be extremely significant in predicting total FDT costs. The calculated F value of 2328.5 was well above the

one percent critical region for a simple regression of 24 observations. The coefficient of determination of 0.9906 and standard error of estimate of 0.1138 indicate that weight could be used with considerable accuracy to predict actual FDT costs. The MAPD of the actual data points from the estimated regression line was 21 percent. The predictive equation is then

$$F = 0.03784\, W^{1.05241} \qquad (1)$$

$$\text{or } \log F = -1.42206 + 1.05241 (\log W)$$

where:

F = estimated total FDT cost in dollars

W = unit weight of end-item in pounds

Volume alone did not prove to be as valuable a predictor as weight. However, when used in conjunction with weight it caused a reduction in the MAPD cited above to 18 percent. Significant at the one percent critical region with an F value of 1522.8, this multiple regression produced a coefficient of determination of 0.9932. Also, the standard error of estimate was reduced to 0.0997. The two independent variable equation is then

$$F = 0.09650\, W^{0.80444}\, C^{0.25426} \qquad (2)$$

$$\text{or } \log F = -1.01548 + 0.80444 (\log W) + 0.25426 (\log C)$$

where:

F = estimated total FDT cost in dollars

W = unit weight of end-item in pounds

C = unit volume of end-item in cubic feet

C. Predictions of second-leg FDT costs

Here again, weight was found to be the best predictor of second-leg FDT costs. Although price or volume used alone produced statistically significant results, neither out-performed weight. The exponential equation produced by the simple regression of weight against second-leg FDT is

$$OF = 0.02751\ W^{1.03575} \qquad (3)$$

$$\text{or } \log OF = -1.56057 + 1.03575\ (\log W)$$

where:

OF = estimated second-leg FDT cost in dollars

W = unit weight of end-item in pounds

This equation is significant at the one percent critical level with a computed F value of 2130.2, and an r^2 of 0.9893. The standard error of the estimate is 0.1177 with a MAPD of 21 percent.

Used in conjunction with weight, price did not improve the predictive equation enough to merit its inclusion. The inclusion of volume in the equation did, however, reduce the MAPD to 16 percent. The equation resulting from the multiple regression of weight and volume against second-leg FDT costs then becomes

$$OF = 0.06685\ W^{0.80009}\ C^{0.24219} \qquad (4)$$

$$\text{or } \log OF = -1.17489 + 0.80009\ (\log W) + 0.24219\ (\log C)$$

where:

OF = estimated second-leg FDT cost in dollars

W = unit weight of end-item in pounds

C = unit volume of end-item in cubic feet

The computed F value of 1308.3 was again well above the critical region at the one percent level. The R^2 is extremely high at 0.9917, and the standard error of the estimate is 0.10636.

D. Predictions of interim FDT costs

As with the previous cases, weight was the dominant factor in predicting interim FDT costs. For all twenty-four observations to which interim FDT costs applied, the regression equation was

$$IF = 0.00755\ W^{1.13752} \qquad (5)$$

$$\text{or } \log IF = -2.12194 + 1.13752\ (\log W)$$

where:

IF = estimated interim FDT cost in dollars

W = unit weight of end-item in pounds

The computed F value for this equation is 334.5, which is well above the one percent critical region. It also has an R^2 of 0.9383. The problem with this equation, however, is the high standard error of the estimate of 0.3246 and MAPD of 72 percent. This would indicate that although the regression line fits the actual data points well, the dispersion of points about that line is so great that the risk of being in extreme error for a single prediction is high.

Adding volume to the equation reduces the MAPD to 68 percent and the standard error of the estimate to 0.3234. With a significant F value of 169.1 and R^2 of 0.9415, the multiple regression equation is

$$IF = 0.02470\ W^{0.82368}\ C^{0.32179} \qquad (6)$$

$$\text{or } \log IF = -1.60737 + 0.82368\ (\log W) + 0.32179\ (\log C)$$

where:

IF = estimated interim FDT cost in dollars

W = unit weight of end-item in pounds

C = unit volume of end-item in cubic feet

In an effort to further reduce the MAPD and standard error, the data was broken into several subsamples based on an analysis of the residual terms and actual plots of the simple regression results. The best results were obtained by dividing the data into two subsamples, based on weight, with the line of demarcation being W equals 10 pounds.

For W less than 10 pounds, the best results were obtained from the multiple regression equation of

$$IF = 0.11961\ W^{0.52808}\ C^{0.70191} \qquad (7)$$

$$\text{or } \log IF = -0.92225 + 0.52808\ (\log W) + 0.70191\ (\log C)$$

where:

IF = estimated interim FDT cost in dollars

W = unit weight of end-item in pounds

C = unit volume of end-item in cubic feet

The equation is significant at the one percent level with an F value of 44.2 and has an R^2 of 0.9171 for its 11 observations. The standard error of the estimate is 0.3599 and the MAPD is 64 percent.

For W greater than or equal to 10 pounds, the multiple regression equation is

$$IF = 0.00042\ W^{1.85615}\ C^{-0.39842} \qquad (8)$$

$$\text{or } \log IF = -3.37949 + 1.85615\ (\log W) - 0.39842\ (\log C)$$

where:

IF = estimated interim FDT cost in dollars

W = unit weight of end-item in pounds

C = unit volume of end-item in cubic feet

The calculated F value of 43.4 reveals the equation to be significant at the one percent critical level. With an R^2 of 0.8968, the equation's standard error of the estimate is 0.1869 and its MAPD is 32 percent.

E. Econometric problems

Econometric problems of autocorrelation, heteroskedasticity, and multicollinearity do not detract from the results of this study.

Autocorrelation results when the sample values of the error terms, or the differences between the actual and estimated values of the dependent variable, are not independently distributed. A problem of this nature does not generally bias estimates of the regression coefficients, but it could negate the use of the F test for significance. Using the Durbin-Watson statistic (ref 2), however, no autocorrelation could be found in the reported equations.

Heteroskedasticity arises when the error terms do not all have the same variance: for example, when the size of the dependent variable and the error term are related. As with autocorrelation, this problem does not introduce bias into the estimates of the regressions coefficients, but it could have an impact on the results of the F test. Using Bartletts' test (ref 2) at the five percent critical region, only equation (1) had significant heteroskedasticity.

Finally, multicollinearity arises in multiple regressions when the independent variables are correlated among themselves, making it difficult to determine the individual effects of the variables. A high degree of correlation was found to exist between the independent variables of this study. For predictive equations, though, multicollinearity does not present any difficulty. While the effects of the independent variables in a multiple equation cannot be accurately determined, the overall significance of the equation is not effected. Therefore, if the multicollinearity is expected to continue into the future, the inclusion of intercorrelated variables may even increase the predictive powers of the resultant equation.

F. Summary of results

The reported results may be summarized as follows:

Equation	R^2	MAPD
(1) $F = 0.03784\ W^{1.05241}$		
or $\log F = -1.42206 + 1.05241 (\log W)$	.9906	21%
(2) $F = 0.09650\ W^{0.08444}\ C^{0.25426}$		
or $\log F = -1.01548 + 0.80444 (\log W) + 0.25426 (\log C)$	.9932	18%
(3) $OF = 0.02751\ W^{1.03575}$		
or $\log OF = -1.56057 + 1.03575 (\log W)$	.9893	21%
(4) $OF = 0.06685\ W^{0.80009}\ C^{0.24219}$		
or $\log OF = -1.17489 + 0.80009 (\log W) + 0.24219 (\log C)$	.9917	16%
(5) $IF = 0.00755\ W^{1.13752}$		
or $\log IF = -2.12194 + 1.13752 (\log W)$	.9383	72%

Equation	R^2	MAPD
(6) $IF = 0.02470\ W^{0.82368}\ C^{0.32179}$		
or $\log IF = -1.60737 + 0.82368 (\log W) + 0.32179 (\log C)$	.9415	68%
(7) $IF\ (\text{for } W<10) = 0.11961\ W^{0.52808}\ C^{0.70191}$		
or $\log IF\ (\text{for } W<10) = -0.92225 + 0.52808 (\log W) + 0.70191 (\log C)$	.9171	64%
(8) $IF\ (\text{for})\ W\geq 10) = 0.00942\ W^{1.85615}\ C^{-0.39842}$		
or $\log IF\ (\text{for } W\geq 10) = -3.37949 + 1.85615 (\log W) - 0.39842 (\log C)$	.8968	32%

where F, OF, IF, W, C, R^2, and MAPD are defined as above.

V. Conclusions and Recommendations

For overall predictive ability and minimized risk, the exponential multiple regression equation (2) for total FDT cost is preferred. As evidenced by the high coefficient of determination (R^2), practically all of the variation in the dependent variable is explained by variations in unit weight and volume. The actual data points are relatively close to the regression line (evidenced by the mean absolute percent deviation): therefore, the actual FDT costs for individual items should fall fairly close to the predicted values.

In some cases, however, FDT costs must be divided into interim and second-leg components. When this division is necessary, the recommended predictor for second-leg FDT cost is the multiple regression (4). With an extremely high R^2 and relatively low mean absolute percent diviation this equation should amply forecast FDT costs for end-items leaving the LAP plants.

To predict interim FDT costs, two equations are suggested. For weight below ten pounds, equation (7) should be used. The high R^2 indicates that unit weight and volume explain practically all variations in interim FDT costs. However, the high mean absolute percent deviation indicates that considerable risk exists in predicting FDT costs for individual components entering LAP plants. For all items collectively, though, the predictive equation should work quite well.

The risk involved in individual interim estimates may be due to the independent variables involved. Both unit weight and volume are

descriptive of the completed end-item. These characteristics could vary greatly among the individual components making up that end-item. Individual component data, however, would be voluminous and difficult to obtain; therefore, for this study, the end-item was appropriate.

For items with weights of ten pounds or greater, equation (8) is recommended. The R^2 substantially indicates that variations in weight explain most of the variation in interim FDT cost. There is less risk involved when estimating individual costs within this group, as indicated by the MAPE, which is half that for the smaller weight group.

It should again be noted that this study is based on a cross-sectional sample of actual FDT costs during the third quarter of FY 75. Time series data were not available during the study but collection of such data has since been established. The ARMCOM Transportation Directorate is now collecting and reporting FDT cost, weight, and volume information on the initial sample, as well as on new contract items. Furthermore, within the ARMCOM Management Information Systems Directorate, a special form of the automated standard pricing model has been made available for future use. This will make standard prices, excluding FDT costs, available and will flag the component items to which interim transportation costs apply. Therefore, a data-collecting framework has been established for further updates of this initial study.

Although the estimating equations set forth in this study are the best available for the defined initial period, they may change with time.

Unit weight and volume are constants; therefore, the regressions will have to be run on a recurring basis in order to reflect such things as inflationary increases in transportation costs.

Although standard price did not play a relevant part in these initial estimating relationships, the situation may change as more data becomes available. In fact, the relationships of weight and volume could even change. It is, therefore, suggested that the Cost Analysis Division of the ARMCOM Comptroller review the relationships regularly under the framework of this study. Then after several reviews of updated data, definite interactions of the three independent variables may be defined. At that point, a simple computer program, which performs the necessary regression analyses, may be written for use external to the Cost Analysis Division.

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APPENDIX

The following tables compare the results of estimating interim and second-leg FDT costs by the current method (factors of three percent and four percent for interim and second-leg, respectively) and the regression equations suggested by this study. To the right of each estimated cost is the percentage variation of that estimate from the actual value.

TABLE A-1

INTERIM EDT COSTS

ODIC	Actual IF	3% St. Price	% Variation	Suggested Regression	% Variation	Regression Equation Used
071	.0001	NA	NA	.0001	0	7
080	.0001	NA	NA	.0001	0	7
131	.0002	NA	NA	.0004	100.00	7
792	.0127	NA	NA	.0075	-40.94	7
546	.0278	.1079	288.13	.0260	- 6.47	7
577	.0290	.0797	174.83	.0071	-75.52	7
632	.0511	.2618	412.33	.0737	44.23	7
256	.2821	.4061	43.96	.1286	-54.41	8
445	.7655	NA	NA	.7318	- 4.40	8
449	.9769	NA	NA	.7618	-22.02	8
511	1.1419	2.6166	129.14	.9516	-16.67	8
518	1.4744	2.5155	70.61	.8771	-40.51	8
650	.3558	2.2833	541.74	.6618	86.00	8
651	.5181	2.2072	326.02	.7725	49.10	8
706	.5082	1.2344	142.90	.4278	-15.82	8
[illegible]	.0900	.3291	265.67	.0951	5.67	8
541	.2025	.5025	148.15	.2793	37.93	8
544	2.3405	NA	NA	2.3137	- 1.15	8
563	1.9543	NA	NA	2.3295	19.20	8
881	.0282	.0384	36.17	.0226	-19.86	7
945	.0073	NA	NA	.0269	268.49	7
143	.0353	.3906	1006.52	.0523	48.16	8
495	0	0	---	---	---	
278	.0827	.7134	762.64	.0411	-50.30	7
335	.0233	.1797	671.24	.0402	72.53	7

TABLE A-2

SECOND-LEG FDT COSTS

DODIC	Actual OF	4% St. Price	% Variation	Suggested Regression	% Variation	Regression Equation Used
A071	.0009	.0030	233.33	.0009	0	4
A080	.0005	.0023	360.00	.0006	20.00	4
A131	.0023	.0053	130.43	.0023	0	4
A792	.0261	NA	NA	.0255	- 2.30	4
B546	.0334	.1802	439.52	.0352	5.39	4
B577	.0117	.1346	1050.43	.0222	89.74	4
B632	.2223	.4480	101.53	.1624	-26.95	4
C256	.6877	.9808	42.62	.5991	-12.89	4
C445	1.5380	NA	NA	1.7178	17.98	4
C449	1.7308	NA	NA	1.7702	2.28	4
C511	1.6738	3.9219	134.31	2.4126	44.14	4
C518	2.3156	3.9898	72.30	2.3842	2.96	4
C650	2.3871	3.8189	59.98	1.9134	-19.84	4
C651	2.5864	3.8519	48.93	2.0361	-21.28	4
C706	1.1465	2.6377	130.07	1.3038	13.72	4
D540	.5747	.7689	33.79	.5722	- 0.44	4
D541	1.1478	1.0636	- 7.34	1.1792	2.74	4
D544	2.5274	NA	NA	2.5416	0.56	4
D563	2.3945	NA	NA	3.0092	25.67	4
G881	.0589	.1041	76.74	.0571	- 3.06	4
G945	.0626	NA	NA	.0613	- 2.08	4
K143	.2424	.9263	282.14	.3011	24.22	4
L495	.0569	.2262	297.54	.0574	0.89	4
N278	.1607	1.0412	547.92	.1029	-35.97	4
N335	.1629	.3157	93.80	.1038	-36.28	4